

USSR

SVERDLOV, A. G., et al, Doklady Akademii Nauk SSSR, Vol 196, No 1, 1971, pp 220-222

of all radioprotectors at increased pressure remained the same as at normal pressure, despite the sharp rise of tissue  $pO_2$  during irradiation. Some of the results are statistically unreliable. Thus hypoxia does not decrease the radioprotective effect in the examined compounds.

3/3

USSR

METROPOL'SKIY, Academician of the Ukrainian Academy of Sciences Yu. A.;  
LYKOVA, O. B.; BOGATYREV, B. M. (Mathematics Institute, Ukr. Academy of Sciences)

"Method of Rapid Convergence in the Problem of Construction of a Lyapunov Function"

Kiev, Dopovidi Akademii Nauk Ukrain's'koi RSR: Seriya A - Fizyko-Tekhnichni ta Matematychni Nauky; August, 1972; pp 702-6

ABSTRACT: A method is suggested for the construction of a Lyapunov function  $V(\phi, x)$  of a weakly nonautonomous linear system of equations

$$\frac{dx}{dt} Ax + P(\phi)x, \frac{d\phi}{dt} = \omega,$$

with the assumption that  $\|P(\phi)\|$  is small and  $P(\phi)$  is a fairly smooth function of  $\phi$  representable by  $\phi$  in the form of a Fourier series.

The proposed method is based on the Krylov-Bogolyubov idea of successive substitution of variables, ensuring rapid convergence.

1/1 The article includes 27 equations. There are 9 references.

- 2 -

1/2 016 UNCLASSIFIED PROCESSING DATE--20NDV70  
TITLE--REALIZATION OF THE 1968 PROBLEM TOPICS PLAN FOR THE PROBLEM SOCIAL  
HYGIENE AND PUBLIC HEALTH ORGANIZATION AND ADMINISTRATION -U-  
AUTHOR--BOGATYREV, I.D.

COUNTRY OF INFO--LSSR

SOURCE--MOSCOW, SOVETSKOYE ZDRAVOOKHRANENIYE, RUSSIAN, NO 5, 1970, PP  
58-91  
DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--PUBLIC HEALTH, STATISTICS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3005/C683

STEP NO--UR/0753/70/000/005/0088/0091

CIRC ACCESSION NO--AP0132801

UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0132801

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN 1968 74 MEDICAL INSTITUTES, 11 INSTITUTES FOR ADVANCED TRAINING OF PHYSICIANS, FOUR UNIVERSITIES (CHAIRS AND COURSES IN THE FIELD OF SOCIAL HYGIENE AND PUBLIC HEALTH ORGANIZATION), AND 18 SCIENTIFIC RESEARCH INSTITUTES PARTICIPATED IN CARRYING OUT THE SCIENTIFIC RESEARCH PLAN CONCERNING THE PROBLEM "SOCIAL HYGIENE AND PUBLIC HEALTH ORGANIZATION AND ADMINISTRATION". SCIENTIFIC PROJECTS WERE COMPLETED BY 93 ESTABLISHMENTS (77 CHAIRS OF SOCIAL HYGIENE AND PUBLIC HEALTH ORGANIZATION OF MEDICAL INSTITUTES, MEDICAL FACULTIES, UNIVERSITIES, AND INSTITUTES FOR ADVANCED TRAINING OF PHYSICIANS, AND ALSO 16 SCIENTIFIC RESEARCH INSTITUTES). RESEARCH WAS CONDUCTED ON THE PROBLEM BY 1,200 SCIENTISTS, WHILE 651 PARTICIPATED IN WORK THAT WAS COMPLETED. TABLE 1 INDICATES THE DISTRIBUTION OF THOSE WHO COMPLETED PROJECTS IN 1968 AMONG THE SPECIFIC PROBLEMS. TABLE 1. SPECIFIC PROBLEMS AND NUMBER OF WORKERS ON COMPLETED PROJECTS IN 1968. TABLE 2. DISTRIBUTION OF COMPLETED PROJECTS COVERED BY THE PLAN AMONG THE SPECIFIC PROBLEMS FOR 1967 AND 1968.

UNCLASSIFIED

USSR

UDC 547.25'115

MEL'NIKOV, N. N., SHVETSOVA-SHILOVSKAYA, K. D., and BOGATYREV, I. I.

"Displacement of Pseudohalogens in Phosphinates and Phosphine Oxides"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 7, Jul 70, p 1662

Abstract: A previous article by the authors showed that in phosphonates alkyl groups with high electronegativity such as the trichloromethyl and 2,2,2-trichloro-1-acetoxyethyl group, which can be regarded as pseudohalogens, are displaced by alkoxyl groups under the action of alcohol in the presence of alkalis. Continuing their work in this area, the authors studied the displacement of pseudohalogen groups in phosphinates and phosphine oxides under analogous conditions. It was found that the pseudohalogen group is much more readily displaced by an alkoxyl group in phosphinates and phosphine oxides than in phosphonates. Weaker bases (e.g., trialkylamines) can be used as catalysts.

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USSR

UDC: 531.7.087.92

BOGATYREV, N. T., FOMENKO, A. A.

"Current Relay"

Shakhtnaya Avtomatika [Mine Automation -- Collection of Works], Donetsk, 1969, pp 83-86 (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 7, 1970, Abstract No 7A108, by N. S.)

Translation: A current relay of a new design is analyzed. The relay consists of a body, transition clutches, permanent magnets, a ferromagnetic ball, limiting grids, a type MKV-1 magnetically controlled contact, four filter magnets, and a screen. The operating principle of the relay is described and its technical characteristics are presented. Two illustrations.

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USSR

UDC 669.71.042.62

KUROCHKIN, P. D., KUZNETSOV, V. S., BOGATYREV, V. A.

"Production of Cast Aluminum Strip"

V sb. Novoye v protsessakh goryachey obrabotki met. (What's New in the Processes of Hot Working of Metals -- collection of works), Moscow, Mashinostroyeniye Press, 1971, pp 44-47 (from RZh--Metallurgiya, No 4, Apr 72, Abstract No 46171)

Translation: A study was made of the problem of producing aluminum strip by the method of casting in a roll crystallizer and the possibility of controlling the aluminum crystallization process. Four illustrations.

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- 4 -

USSR

UDC 621.039.51.001.8

ARNOL'DOV, M. N., BOGATYREV, V. K., DUBOVSKIY, B. G., IVANOVSKIY, M. N.,  
KALENICH, V. N., KIR'YANOV, G. I., MILOVIDOVA, A. V., FROLOV, V. V.

"Activation Control of Oxygen in Circulating Sodium-Potassium Coolant Using  
a Neutron Generator"

Tr. VNII radiats. tekhn. (Works of the All-Union Scientific Research Institute  
of Radiation Engineering), 1972, No. 7, pp 137-144 (from RZh-50. Yadernyye  
reaktory, No 11, Nov 72, Abstract No 11.50.93)

Translation: The first stage in carrying out continuous control of oxygen in a  
circulating loop with an Na-K alloy and a mockup of a nuclear reactor circuit  
is described. The basis of the method is the familiar reaction for deter-  
mining oxygen on the basis of  $N^{16}$  (the reaction  $O^{16} (n, p) N^{16}$ ). A small-  
scale neutron generator of the type NGI-5 with a flux of about  $5 \cdot 10^8$  neutron/  
/sec was used for activation. This method for oxygen control on the basis of  
the  $N^{16}$  isotope is also applicable in the active loop of a nuclear reactor.  
4 ill., 2 tables, 2 ref.

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USSR

UDC 541.183.24

NIKOLAYEV, A. V., BOGATYREV, V. I., ZHURKO, F. V., VULIKH, A. P.,  
SOKOLOVA, S. I., LYUBMAN, N. YA., Institute of Inorganic Chemistry,  
Siberian Department, Academy of Sciences of the USSR

"Ion Exchange Equilibrium Between Ionite Grains"

Moscow, Doklady Akademii Nauk SSSR, Vol 198, 1971, No 1, pp 138-  
140

Abstract: Known formulas to determine the equilibrium state in the case of inter-grain affinity can be applied only if the inter-bond exchange by counterions takes place by the predominantly simple mechanism involved in direct contact between grain surfaces. If other factors besides contact play any considerable role (such as ionite hydrolysis), these must be considered as well, and be brought into the formula for equilibrium state. The authors derive empirically several formulas for ion exchange between ionite grains.

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- 2 -

USSR

UDC 541.127

NIKOLAYEV, A. V., Academician, ~~BOGATYREV, Y. I.~~, and ZHURKO, F. V., Institute of Inorganic Chemistry, Siberian Department of the Academy of Sciences USSR, Novosibirsk

"Mechanism and Kinetics of Ion Exchange Between Ionite Grains"

Moscow, Doklady Akademii Nauk, SSSR, Vol 200, No 4, 1971, pp 886-889

Abstract: This study examines intergranular counterion exchange occurring only on direct contact of the swollen grains of ion exchangers in completely deionized water. An example is intergranular counterion exchange in the contact of monofunctional strongly ionized resins in such ionic forms where hydrolysis is practically ruled out. An electrochemical model of the exchange interaction of two ionite grains with the participation of electric double layers is given, and the principal factors influencing the exchange process rate are considered.

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USSR

UDC 666.11.01:536.413.2

BOGATYREVA, V. V., BOGATYREV, YU. Z., and SOLOV'YEVA, T. I.

"The Heat Expansion of Glass of the PbO-SiO<sub>2</sub> System, Depending Upon the Composition"

Leningrad, Optiko-Mekhanicheskaya Promyshlennost', No 8, Aug 73, pp 34-36

**Abstract:** An investigation is made of the relation of the coefficient of linear heat expansion to the temperature and composition of glass of the two-component PbO-SiO<sub>2</sub> system with a content of 25 to 67 molecular percent PbO. Simple formulas were experimentally derived, which enable the coefficient of linear heat expansion to be calculated with an exactness to within  $\pm 0.5\%$  for glass of the PbO-O<sub>2</sub> system, and approximately for all types of flint glass, from room temperature to the glass-annealing temperature. A graphic relationship of the mean coefficient of linear heat expansion of glass of the indicated system to the content of PbO (in molecular percent) is presented, as well as formulas for the calculation of this relationship. 3 figures. 1 table. 3 references.

1/1

BOGATYREV, Yury K.

"Nonlinear Theory of Tunnel-Diode Amplifiers with Distributed Parameters"

Gor'kiy, Izvestiya VUZ -- Radiofizika, Vol. 13, No. 9, pp 1361-1366

Abstract: The method used by the author in investigating the theory of nonlinear amplifiers is the averaging method applied to the nonlinear differential-difference equations describing the wave process in the amplifier using tunnel diodes for steady-state as well as transient operation modes. Reflections from incompletely matched loads are taken into account. The circuit considered in the calculations is one stage of a multistage circuit, each stage of which contains a tunnel diode. The author develops formulas for the stage's operation when there is no reflection or where the reflection is a minor factor, as in a pulse amplifier where the pulses are relatively narrow. Amplifiers of this type are successfully used for strengthening signals in the 300-800 MHz range and above. Amplification at lower frequencies is difficult since the structural elements of the circuit become too large and since such amplifier stages, containing a single active element, do not provide marked amplification or broad bandwidths. In concluding, the author expresses his gratitude to M. I. Rabinovich for the interest he showed in this work.

1/1

USSR

UDC: 621.373.531(088.8)

BOGATYREV, Yu. K., RABINOVICH, M. I., The Radio Physics Scientific Research  
Institute Affiliated With Gor'kiy University

"A Pulse Generator"

USSR Author's Certificate No 270786, filed 22 Jun 67, published 11 Aug 70  
(from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1G211 P)

Translation: This Author's Certificate introduces a pulse generator based on an inductance-capacitance shaping line. The unit contains a tunnel diode and series-connected L-shaped links made up of an inductance and capacitance connected through voltage dividers to a power supply. To produce synchronized pulses of sequentially changing duration, and with sequentially changing polarity beginning at the middle of the line, the latter is shorted at both ends, and a tunnel diode is connected in each of its links in parallel with the inductance through one of the resistors in the voltage divider.

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B  
USSR

UDC 621.373.51:621.373.43

BOGATYREV, YU. K., RABINOVICH, M. I.

"Pulse Generator"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzsv, Tovarnyye Znaki,  
No 17, 12 May 70, p 34, Patent No 270786, Filed 22 Jul 67

Translation: This Author's Certificate introduces a pulse generator made of a shaping LC-line containing tunnel diodes and series-connected L-type inductance and capacitance elements connected via voltage dividers to a power supply. The generator is distinguished by the fact that in order to obtain synchronized pulses of sequentially varying length and beginning with the middle of the line and varying polarity, the line is shorted on both ends, and a tunnel diode is connected via one of the resistors of the voltage divider in each of its sections parallel to the inductance.

1/1

USSR

UDC 541.183.5:546.799.4

DAVYDOV, YU. P., and BOGATYREVA, I. G.

"Sorption of Pu(IV) by ion Exchange Resins in the Area of Plutonium (IV) Hydrolysis"

Leningrad, Radiokhimiya, Vol 14, No 2, 1972, pp 200-206

Abstract: Experiments were carried out aimed at finding out whether the hydrolyzed forms of plutonium (IV) possess the specificity of absorption and whether this specificity is due to the formation of monomeric hydroxy complexes in the solution or of the polynuclear hydroxy complexes. A wide range of acidity and concentration of plutonium in 7N HNO<sub>3</sub> was used on ion exchange resins KU-2, AV-17, and Dowex-1. The study showed that hydrolyzed monomeric Pu(IV) ions show no specificity in their behavior in respect to above resins. Several forms of complexes are found in the solution -- Pu<sup>4+</sup>, Pu(OH)<sup>3+</sup>, Pu(OH)<sub>2</sub><sup>2+</sup>, etc. -- and it is quite possible that only one of these ions is absorbed selectively. The polynuclear PU(IV) complexes exhibit lower sorption ability than the monomeric Pu(IV) ions.

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USSR

UDC 539.216.2:538.2

KIM, P. D., POTYLITSYN, V. I., BOGATYREVA, L. A., RODICHEV, D. M., and  
SAFONOV, I. A., Krasnoyarsk Polytechnical Institute

"Energy of Domain Boundaries in Permalloy Films"

Moscow, Fizika Metallov i Metallovedeniye, Vol 30, No 5, 1970, pp 903-907

Abstract: A method is suggested for measuring the energy density of domain boundaries in thin permalloy films with circular anisotropy. The measurements, performed on a film 1,100 Å thick, yield values of domain boundary energy density  $\gamma$  near 4.2 erg/cm<sup>2</sup>, which agrees well with the theoretical estimates for films of this thickness. In the area of thicknesses less than 1,000 Å, the measured energy values exceed the expected values, reaching 18 erg/cm<sup>2</sup>. An attempt is made at experimental study of  $\gamma$  as a function of the constant field intensity applied perpendicular to the plane of the circular boundary.

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USSR

UDC 542.957:547.559.77:547.559.78:547.1'118

NESMEYANOV, A. N., USTYNYUK, N. A., BOGATYREVA, L. V., and MAKAROVA, L. G.,  
Institute of Element Organic Compounds, Academy of Sciences USSR

"Reactions of the Phenyl Derivatives of the Metal Carbonyls of Molybdenum  
and Tungsten With Triphenylphosphine and Triphenyl Phosphite"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, 1, Jan 73, pp  
62-67

Abstract: The products of the reaction of  $C_5H_5W(CO)_3C_6H_5(I)$  with  $P(C_6H_5)_3$   
and  $P(OC_6H_5)_3$  -- e.g.,  $C_5H_5W(CO)_2LC_6H_5+CO$ ;  $C_5H_5W(CO)_2LCO C_6H_5$ ; or  
 $W(CO)_3L_2 + \{C_5H_5\} + \{C_6H_5\}$  -- depend on the condition. (L is either of  
the P ligands). A series of  $C_{31}$  to  $C_{57}$  phospho derivatives of W and Mo  
were prepared and characterized by physical data, elemental composition,  
and spectral and NMR data. Stereochemistry, exchange of the ligands, and  
the effects of a limited number of solvents were considered.

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Heat, Combustion, Detonation

USSR

UDC 621.039.587

BOGATYREVA, S. V., LEBEDEV, Yu. Ye., MILAYEV, A. I., TEVLIN, S. A.

"Study of the Possibility of Applying Complexons in Cooling Channels in the Presence of Radiation"

Tr. Mosk. energ. in-ta (Works of Moscow Power Engineering Institute), 1972, No. 126, pp 24-27 (from RZh-50. Yadernyye reaktory, No 11, Nov 72, Abstract No 11.50.36)

Translation: Solutions of compositions based on complexons can be used to wash cooling channels if the radiation doses are not too high. Active deposits are partially washed off. The presence of radiation accelerates processes within the coolant that determine the development of a protective film on pearlite steels. This makes it possible to shorten the time for treating the channels as compared with the time expended under ordinary methods. 1 ill., 2 ref.

1/1

USSR

UDC 620.197.1

MARGULOVA, T. KH., Doctor of Technical Sciences, BURSUK, L. M., Candidate of Technical Sciences, BOGATYREVA, S. V., Engineer, LIPANINA, A. A., Engineer; Moscow, Power Engineering Institute

"The Corrosion of Structural Materials in Boron-Containing Solutions That are Used for Controlling the Pump Work of Nuclear Reactors"

Moscow, Teploenergetika, No 12, 1970, pp 14-17

Abstract: The corrosion resistance of steel 1Kh18N9T, zirconium alloys with 1 and 2.5% niobium (the materials of fuel-element shells and cassettes), as well as carbon steel 20 and low-alloy vessel steel in boron-containing solutions is investigated. It is shown that the use of boric acid for "soft" control and the emergency stopping of nuclear reactors does not bring about corrosion of the structural materials. Five figures, 3 tables.

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1/2 023 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--THE IMPORTANCE OF ALLERGY TO DRUGS IN THE CONSERVATIVE TREATMENT OF  
PULPITIS -U-  
AUTHOR--(02)-OVRUTSKIY, G.D., BOGATYREVA, V.A. *B*  
COUNTRY OF INFO--USSR  
SOURCE--STOMATOLOGIYA, 1970, VOL 49, NR 3, PP 27-29  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--ORAL DISEASE, TOOTH, ALLERGIC DISEASE, ORAL HYGIENE,  
ANTIBIOTIC  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1998/0096 STEP NO--UR/0511/70/049/003/0027/0029  
CIRC ACCESSION NO--AP0120796  
UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0120796

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN 451 PATIENTS WITH A DIVERSE IMMUNOLOGICAL REACTIVITY THE AUTHORS INVESTIGATED THE EFFECTIVENESS OF CONSERVATIVE TREATMENT OF PULPITIS OF 479 TEETH. ALONG WITH CLINICAL INDICES OF THE STATE OF DENTAL PULP THE AUTHORS CONDUCTED AN ALLERGOLOGICAL EXAMINATION OF PATIENTS AND STUDIED THE SENSITIVITY OF THE MICROFLORA OF THE CARIOUS CAVITY TO THE ANTIBIOTICS EMPLOYED. IT WAS ESTABLISHED THAT THE ALLERGIC SENSITIVITY OF THE ORGANISM INFLUENCES THE OUTCOME OF THE TREATMENT TO A GREATER DEGREE THAN THE MICROFLORAL SENSITIVITY OF THE CARIOUS CAVITY TO THE MEDICINAL PREPARATION USED.

FACILITY: KAFEDRA TERAPEVTICHESKOY STOMATOLOGII AND KAFEDRA PATOLOGICHESKOY FIZIOLOGII KAZANSKOGO MEDITSINSKOGO INSTITUTA.

UNCLASSIFIED

USSR

UDC 666.11.01:536.413.2

BOGATYREVA, V. V., BOGATYREV, YU. Z., and SOLOV'YEVA, T. I.

"The Heat Expansion of Glass of the PbO-SiO<sub>2</sub> System, Depending Upon the Composition"

Leningrad, Optiko-Mekhanicheskaya Promyshlennost', No 8, Aug 73, pp 34-36

**Abstract:** An investigation is made of the relation of the coefficient of linear heat expansion to the temperature and composition of glass of the two-component PbO-SiO<sub>2</sub> system with a content of 25 to 67 molecular percent PbO. Simple formulas were experimentally derived, which enable the coefficient of linear heat expansion to be calculated with an exactness to within  $\pm 0.5\%$  for glass of the PbO-SiO<sub>2</sub> system, and approximately for all types of flint glass, from room temperature to the glass-annealing temperature. A graphic relationship of the mean coefficient of linear heat expansion of glass of the indicated system to the content of PbO (in molecular percent) is presented, as well as formulas for the calculation of this relationship. 3 figures. 1 table. 3 references.

1/1

1/2 021 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--CERTAIN PROBLEMS OF LOW TEMPERATURE TENSOMETRY -U-  
AUTHOR-(03)-BOGAYCHUK, V.I., KOZLOV, I.A., LIKHATSKIY, S.I.  
COUNTRY OF INFO--USSR  
SOURCE--PROBLEMY PEGCHNOSTI, VOL. 2, MAR. 1970, P. 86-89  
DATE PUBLISHED--70  
SUBJECT AREAS--METHODS AND EQUIPMENT, PHYSICS  
TOPIC TAGS--TENSILE TEST, STRAIN MEASURING INSTRUMENT, LOW TEMPERATURE EFFECT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--2000/1230 STEP NO--UR/3663/70/002/000/OJ86/0089  
CIRC ACCESSION NO--AP0124684  
UNCLASSIFIED

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2/2 021

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124884

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. DISCUSSION OF SOME PROBLEMS IN LOW TEMPERATURE TENSOMETRY WITH RESPECT TO ITS APPLICATION FOR STUDYING THE STRESS STRAIN STATE OF TURBINE DISKS OPERATING AT TEMPERATURES DOWN TO 77 DEG K. THE EFFECTS OF LOW TEMPERATURE ON THE STRAIN SENSITIVITY COEFFICIENT OF SENSORS ARE ESTIMATED. THE FORMATION OF FICTITIOUS STRAINS AND THE POSSIBILITY OF THEIR DETECTION ARE DISCUSSED.  
FACILITY: AKADEMIIA NAUK UKRAINSKOI SSR, INSTITUT PROBLEM PROCHNOSTI, KIEV, UKRAINIAN SSR.

UNCLASSIFIED



Acc. Nr.

AP0048828

Abstracting Service:  
CHEMICAL ABST.

Ref. Code

UR0459

90933v Adsorption behavior of crystalline polyester and polyamides in a wide temperature range. Bogaevskaya, T. A.; Gatovskaya, T. V.; Kargin, V. A. / Fiz.-Khim. Inst. im. Karpova, Moscow, USSR. Vysokomol. Soedin., Ser. A 1970, 12(1), 243-7 (Russ). The adsorption properties of poly(ethylene sebacate) (I), polycaprolactam (II), and hexamethylenediammonium adipate-hexamethylenediammonium sebacate-II copolymer (III) were investigated at 30-225°. The adsorption of EtOAc by I films was described by hyperbolic isotherms, indicating a strong interaction between I and EtOAc leading to increased flexibility and mobility of the individual structural elements. Significant structural changes were detected at the same temp. at which "capillary condensation" of the sorbate vapors is obsd. Structural transformations in this case also apparently occurred via melting of material with low ordering. Decompn. of the supramol. structure occurred at >95°. The melt of the cryst. polymer was not a homogeneous, mol. dispersed system but contained ordered regions. Little adsorption (<1%) of n-hexadecane by II was obsd. from 130-230°.

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indicating that II is densely packed with few defects in its supra-  
mol. structure. II adsorbed 8-9% *n*-decyl alc. (IV) at 130-225°,  
indicating weak interaction between II and IV. "Capillary con-  
densation" was not obsd. with II apparently because of its homo-  
geneity and lack of flaws. III adsorbed IV much more than II at  
all temps. (130-225°), indicating that it had more defects in its  
supramol. structure and had more loosely packed structural ele-  
ments.

DBJR

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USSR

UDC 621.382.8--416:621.315.592

AYVAZOVA, L. S. and BOGDAN, G. I.

"Film Capacitors Using  $TiO_2$ "

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No. 5, 1971, pp 37-39

Abstract: A description is given of a method for preparing capacitors using Ti- $TiO_2$ -Al films and substrates of sodium and nonalkali glass. The results of experiments performed on these devices are also presented. Specimens with an oxide layer thickness of 1700 Å were found to have a specific capacitance of  $0.3 \mu F/cm^2$ ; the dielectric constant of the layer was 58. Frequency limits of the capacitors were a maximum of 5 MHz. Curves are plotted for the temperature and frequency dependences of the capacitance and dielectric characteristics of these devices. The authors are associated with the Kiev Polytechnical Institute.

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USSR

UDC 539.238:661.888.2

BOGDAN, G. I.

"Active Elements in Film Circuits"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No. 5, 1971, pp 51-56

Abstract: Dielectric films, their theory and mechanisms of operation, are discussed. The films can be divided into three categories: those with thicknesses of the order of one micron, with high resistivity and the characteristics of volume dielectrics; thin films less than 100 Å thick, with high conductivity as the result of the tunnel effect; films 100-4000 Å thick, which differ from the others in the greater complexity of their conductivity mechanism, where the passage of carriers inside the film is strongly affected by the composition of the dielectric and by the large quantity of impurities in the film. This description of film elements deals with N and S negative resistance types, which may be widely used in relaxation oscillator circuits, switching systems, and memory cells. A rather extensive bibliography on the subject is given, and plots are shown of the volt-ampere characteristics for Nb-Nb<sub>2</sub>O<sub>5</sub>-Me S-type structures at various temperatures, and for N-type structures of the same composition. The author is connected with the Kiev Polytechnical Institute.

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USSR

BOGDAN, G. I. and DIMAROVA, Ye. N., Poluprovodnikovaya tekhnika i mikroelektronika, No 5, 1971, pp 70-72

of such structures as thermic sensors is advantageous because they are chemically stable and have a wide range of operating temperatures. They are connected with the Kiev Polytechnical Institute.

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USSR

UDC 621.396.6-181.5

AYVAZOVA, L.S., BOGDAN, G.I.

"Film Capacitors Based On  $TiO_2$ "

Poluprovodn. tekhn. i mikroelektronika. Resp. mezhd. sb. (Semiconductor Technology And Microelectronics. Interdepartmental Collection), 1971, Issue 5, pp 37-39 (from RZh--Radiotekhnika, No 9, Sept 1971, Abstract No 9V293)

Translation: Capacitors are obtained based on an electrolytically oxidized titanium film with a permittivity of  $0.3 \text{ microfarad/cm}^2$  and  $\text{tg } \delta = 0.01-0.05$ . The temperature and frequency characteristics of the specimens are shown. 3 ill. 2 ref. Summary.

1/1

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USSR

UDC 621.382.333.34

BOGDAN, G. I., and DIMAROVA, Ye. N.

"Study of the Thermistor Properties of a Thin-Film Metal-Dielectric-Metal Structure"

Pluprovodn. tekhn. i mikroelektronika. Resp. mezhved. sb. (Semiconductor Technics and Microelectronics. Republic Interdepartmental Collection), 1971, Issue 5, pp 70-72 (from RZh-Elektronika i yeye primeneniye, No 9, Sep 1971, Abstract No 9B490)

Translation: A study is made of the possibility of the use as a sensitive element of a thin-film metal-dielectric-metal structure with an active layer of a  $\text{Nb}_2\text{O}_5$  1000 Å thick. The sensitivity of the element to a change of temperature with a voltage less than the switching voltage is  $50 \pm 5$  mv/deg and the time constant with the given construction of the device is 1 sec. The effect is studied of regimes of oxidation and the formation by current on an oxide layer, on the stability and thermosensitivity of thermistors. 3 ill. 1 Tab. 4 ref.

1/1

USSR

UDC 537.311.32

NEKRASOC, M. M., and BOGDAN, G. I.

"Electrical Properties of Niobium Oxide Film"

Poluprovodn. tekhn. i mikroelektronika. Resp. mezhved. sb. (Semiconductor  
Technics and Microelectronics. Republic Interdepartmental Collection), 1971,  
Issue 5, pp 33-37 (from RZh-Elektronika i yeye primeneniye, No 9, September  
1971, Abstract No 9B53)

Translation: The results are presented of a study of a  $\text{Nb}_2\text{-Nb}_2\text{O}_5\text{-Me}$ . The height of the potential barrier at the boundary of the dielectric and metal and the magnitude of the electron affinity of  $\text{Nb}_2\text{O}_5$  are determined by the voltampere characteristics of thin films ( $d \sim 100 \text{ \AA}$ ). The dependence of the capacitance of thick films ( $d \sim 1000 \text{ \AA}$ ) on a fixed bias is established which confirms the presence of a p-i-n junction in the oxide film. 14 ref. Summary.

1/1



Acc. Nr: **AP0047342**

Ref. Code: **UR0589**

PRIMARY SOURCE: Vestnik Khirurgii **B** I. I. Grekova, 1970,  
Vol 104, Nr / , PP **20-23**

THE PRINCIPLES AND METHODS OF EARLY DIAGNOSIS OF PULMONARY  
CANCER

By T. T. Bogdan

The methods of early recognition of the pulmonary cancer are described. It is considered that chemotherapy could be the only method of radical treatment of this affection in its first "microscopic" stage.

11

REEL/FRAME

19790868

74h

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USSR

UDC: 632.951:631.563.006.5

BLAKITNAYA, L. P., Candidate of Biological Sciences, BOGDAN-BLAKIT-  
NAYA, L. R., Stavropol' Agricultural Institute

"Toxicity of Sumithion for Pests of Grain and Grain Products"

Moscow, Khimiya v Sel'skom Khozyaystve, Vol 10, No 5, 1973, pp 39-  
41

Abstract: Sumithion [0,0-dimethyl-0-(3-methyl-4-nitrophenyl)-  
thiophosphate], a pesticide made by the Japanese company "Sumitoma"  
was field-tested in the Stavropol'skiy Kray. It was found that  
Sumithion in a dose of 0.2 g/m<sup>2</sup> has excellent insecticidal and  
acaricidal properties, and is lethal for most insect and mite pests  
of granaries. When applied to a glass surface, the chemical showed  
contact action for about 20 days on the most harmful granary insects  
and mites. Because of its insecticidal and acaricidal properties  
against a broad spectrum of warehouse pests in the imaginal and  
pre-imaginal forms, and its low toxicity for warm-blooded animals,  
Sumithion (and possibly its analogs -- Metathion from Czechoslovakia,  
Folithion from West Germany, and Methylnitrophos made in the Soviet  
Union) may be extensively used for treating elevators and their  
environs and also equipment used in connection with grain storage.  
1/1

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BOGDANETS, A. D.

FEASIBILITY OF GENERATING MEGAGAUSS  
MAGNETIC FIELDS USING HIGH-PRESSURE  
COMPRESSED GAS LININGS

JPRS 55459  
9 July 1973

(Article by Ye. D. Vasilkov, A. A. Vedenov, A. D. Bogdanets, V. E. Gulyaev, G. G. Koshornitskiy, A. A. Kiselev, I. G. Klybberg, V. V. Chernov, L. L. Chumachenko, Zhurnal Tekhnicheskoy Fiziki, Moscow, Vol. 43, No. 2, 1973, signed to press 8 June 1971, pp 429-438)

The results of calculation of a setup, designed for generating a megagauss pulse magnetic field in a large volume, are presented in this article. The magnetic field is amplified by compression in a cylindrical metal case, pushed by high-pressure gas (1,000-2,000 atm). The expected energy in the compressed magnetic field is several MJ and the lifetime of the field is of the order of 10 msec. In contrast to apparatus using explosives, the examined device is nondestructive; in contrast to devices used for compressing a shell with the energy of an electromagnetic field, the examined system does not experience the problems of super-power storage units and electromagnetic energy converters.

Introduction

Pulsed megagauss fields, especially in a large volume and with high (-1 MJ and above) energies, are very important in modern industry. Thus, they may be used for solving the problem of controlled thermonuclear synthesis [1], investigating matter at superhigh pressures [2], generating a pulse of electromagnetic energy at high power and energies ( $10^4$ - $10^5$  W,  $10^4$ - $10^5$  J). The literature contains the results of analysis of pulsed megagauss fields by collapsing a metal case using explosives [3] or the energy of a capacitor bank [4-6]. The use of explosives is technologically difficult and leads to total destruction of the system; the use of capacitor banks is limited for practical purposes to the energy level of  $10^3$ - $10^4$  J.

The use of the energy of compressed gas for collapsing a cylindrical metal shell (liner), amplifying a magnetic field by "adiabatic" compression

- 1 -  
[1 - USSR - 1]

by the conducting cylinder, the generators of which are parallel to the magnetic force lines, is considered promising. The advantages of this method are: 1) the system is nondestructive; the mechanical requirements on strength are the same as in the case of the apparatus that uses electromagnetic energy, since the magnetic pressure that collapses the liner must have the same magnitude ( $10^{10}$ - $2 \cdot 10^{11}$  atm); 2) rapid application of external pressure on the liner in the examined system does not require the development of high-power commutating systems; the electromagnetic set-up requires presently unavailable storage units and electromagnetic energy commutators ( $10^5$ - $10^7$  J,  $10^3$ - $10^5$  A); explosive systems require synchronous actuation of the detonators; 3) the use of compressed gas makes it possible to obtain more efficient transmission of energy to the field in comparison with explosives and current inductive storage systems.

The most important part of the pneumatic apparatus is the system for breaking a cylindrical diaphragm that holds back all the gas pressure (by means of a cylindrical support grill). Our apparatus incorporates a high-speed magnetic "thermo-pinch" type coil [7], which generates the pulse that releases magnetic pressure.

In contrast to electromagnetic systems, the rate of collapse of the liner in a pneumatic system is limited to the speed of sound in gas. When hydrogen is used at room temperature a radial liner velocity of  $10^3$  cm/sec is completely feasible and is attainable for most applications. Thus, in the case of thermonuclear experiments (compression of deuterium plasma in a magnetic field), the characteristic time of adiabatic compression is determined by a velocity of  $\sim 10^3$  cm/sec, which, finally, requires a very long magnetic field [8].

### 3.1. Description of Apparatus

The apparatus for storing and converting energy (Figure 1) consists of steel body 5, which houses support grate 3 and steel diaphragm 2, installed on it. In the cavity between the diaphragm and the body is gas ( $H_2$  or He) under a pressure of 1,000-2,000 atm.

The diaphragm is a thin-wall steel cylinder with a wall thickness of the order of 1 mm, which is necessitated by the need for rapid and synchronous opening of all parts of the diaphragm (33).

Magnetic diaphragm rupture system 4 consists of six turns (35), wound on insulators. The design of the elements of the magnetic system is illustrated in Figure 2.

The diaphragm rupture system is powered by pulsed capacitors through coaxial sealed cables 6, insulated for 50 kV. Inside the support grate, at a distance of 1-2 mm from its inner surface, is copper liner 1, 140 mm in diameter with a wall thickness of 1-2 mm. An initial magnetic field ( $B_{in} = 1.2 \cdot 10^6$  G) is developed beforehand in the cavity of the liner.

USSR

UDC: 621.384.6.01

BOGDANKEVICH, L. S., RUKHADZE, A. A., and TARAKANOV, V. P.

"Limiting Currents in Electron Beams With Relativistic Energy Dispersal"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, No 4, 1972, pp 900-901

Abstract: The problem of limiting currents and the stability of a compensated electron beam with relativistic energy dispersal of the particles in a strong longitudinal magnetic field inside a cylindrical drift space is investigated in this brief communication. The condition for this analysis is  $T \gg mc^2$ , where  $T$  is the effective temperature characterizing the energy dispersal of the beam,  $m$  is the mass of the particle, and  $c$  is the velocity of light. In two earlier papers (ZhETF, 57, 1969, p 331; UFN, 103, 1971, p 609) the first two authors named above proposed a general method for determining the limiting current based on the condition of electrostatic instability in the beam. However, since heavy-current electron beams in accelerators may have large energy variations, the authors used the approach of the present communication. They thus conclude that the value of the limiting current increases in comparison with the single-energy beam by  $T/mc^2$  times. They are associated with the P. N. Lebedev Physics Institute in Moscow.

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USSR

UDC 533.9

BOGDANKEVICH, L. S. and RUKHADZE, A. A., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

"Stability of Relativistic Electron Beams in a Plasma and the Problem of Critical Currents"

Moscow, Uspekhi Fizicheskikh Nauk, No 4, Apr 71, pp 609-640

Abstract: Recent research in high-current electron accelerators, which have become a subject of renewed interest due to recently expressed ideas concerning using powerful relativistic electron beams to induce controlled thermonuclear reactions and for energy transmission over great distances, is surveyed. Topics covered include limiting currents in uncompensated electron beams, critical currents in compensated unbounded electron beams, the effect of finite longitudinal dimensions of the system on critical currents in the electron beams, the interaction of an unbounded relativistic electron beam with a plasma, the stability of a bounded electron beam in a plasma, and critical currents of relativistic electron beams in a plasma. It is shown that the instability of an electron beam passing through an ion shell determines the limiting current in a compensated electron beam. In the case of nonrelativistic beams this current is only several times greater than the vacuum

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USSR

BOGDANKEVICH, L. S., and RUKHADZE, A. A., Uspekhi Fizicheskikh Nauk, No 4, Apr 71, pp 609-640

limiting current determined by the space charge of electrons of the beam. The situation is different in the case of relativistic energies of beam electrons. It is shown that the critical current in a relativistic compensated beam can exceed the vacuum current by a factor of  $(E/mc^2)^2$ , where  $E$  is the energy of the electrons. It is noted that this rise in current is possible only when current-convective instability does not develop in the system. The theory of the stability of electron beams in a plasma is examined from the aspect of explaining those critical parameters of the plasma and beam under which some form of collective interaction arises in the bounded system. As regards systems with an overcompensated electron beam, it is shown that in the interaction of a relativistic electron beam with a plasma the relative loss of beam energy to excitation of oscillations is of the order of  $(E/mc^2)(n_1/n_2)^{1/3}$ , where  $n_1$  and  $n_2$  are electron densities in the beam and in the plasma, respectively. When this quantity is small, energy losses of the beam and the energy spread of the electrons are slight, and despite the fact that conditions for the development of instability are fulfilled in the system, the beam passes through the plasma practically without change. It is

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USSR

BOGDANKEVICH, L. S., and RUKHADZE, A. A., Uspekhi Fizicheskikh Nauk, No 4, Apr 71, pp 609-640

stated that in this case one would speak about critical currents in the system, as distinct from the case of strictly compensated beams, when the beam loses a considerable portion of its energy as a result of the development of Buneman instability and undergoes essential changes, so that critical currents in compensated beams are simultaneously limiting currents. The final section of the survey is devoted to a comparison between theoretical ideas developed and experiments on the interaction of electron beams with the plasma formed by them.


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USSR

UDC 533.95

  
BOGDANKEVICH, L. S., RUKHADZE, A. A., Physics Institute imeni P. N. Lebedev of  
the Academy of Sciences USSR, Moscow

"Anomalous Absorption of Cyclotron Waves in a Bounded Plasma"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol 40, No 1, Jan 70, pp 10-17

Abstract: The absorption of electron cyclotron waves in a bounded rarefied plasma is investigated under conditions when the Larmor frequency of the electrons is considerably greater than the plasma frequency. Under these conditions in a spatially unbounded plasma the extraordinary cyclotron wave is very strongly absorbed while an ordinary wave is practically not absorbed. In a bounded plasma, such as a waveguide filled with plasma, the absorption of an ordinary wave may become anomalously high due to the interaction of waves at the boundary of the plasma if the wavelength is of the order of the plasma dimensions. The absorption coefficient is then an oscillating function of the wavelength and the dimensions of the system. The cases of a high-temperature collisionless plasma and a cold plasma with a large number of collisions are considered. Recent experiments on the absorption of cyclotron waves in a bounded plasma are discussed on the basis of the theory developed. The experiments were conducted in a rarefield plasma  
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USSR

BOGDANKEVICH, L. S., RUKHADZE, A. A., Zhurnal Tekhnicheskoy Fiziki, Vol 40, No 1, Jan 70, pp 10-17

with a density of  $N \sim 10^{10}-10^{11} \text{ cm}^{-3}$  and a temperature  $T_e \sim 10-20 \text{ ev}$ . Two cyclotron waves were excited in the waveguide: one absorbed at the wavelength  $L_e \sim 1.5 \text{ cm}$  and the second at the wavelength  $L_0 \sim 6 \text{ cm}$ . According to the theory developed here, values for  $L_e$  are approximately 0.5 cm and  $L_0 \sim 5-6 \text{ cm}$ , so there is good agreement with the values observed experimentally.

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Acc. Nr:

AT0050501

Abstracting Service:

NUCLEAR SCI. ABST.

Ref. Code:

UR0141

17937


TO THE THEORY OF INTERACTION BETWEEN A RELATIVISTIC ELECTRON BEAM AND PLASMA. ~~Bogdankevich,~~

~~I. S. Zhelyazkov, I. I. Rukhadze, A. A. (Lebedev Inst. of Physics, Moscow). Izv. Vyssh. Ucheb. Zaved., Radiofiz., 13: 21-7 (1970). (In Russian).~~

The interaction between the limited relativistic electron beam of a small density and plasma being in a strong longitudinal magnetic field is investigated. The critical plasma density, above which the electrostatic instabilities may be developed, is determined. In long enough systems, the critical density of plasma is increased with the growth of its density reaching some value determined by the directed velocity of electrons and the geometrical dimensions of the system. In the systems limited in a longitudinal direction, the critical density of plasma may be dependent also on the system length and magnetic field intensity. In this case the critical density is larger than for a long system. It follows from the analysis of the stability that the maximum current of the electron beam, which may be passed through the waveguide, increases in the relativistic region with the growth of the electron energy as  $\epsilon^3$ . Due to this possibility, large currents may penetrate through a dense plasma. (auth)

REEL/FRAME  
19810484

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1/2 026 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--ANOMALOUS ABSORPTION OF CYCLOTRONIC WAVES IN A BOUNDED PLASMA -U-  
AUTHOR-(02)-BOGDANKEVICH, L.S., RUKHADZE, A.A.   
COUNTRY OF INFO--USSR  
SOURCE--ZHURNAL TEKHNICHESKOI FIZIKI, VOL. 40, JAN. 1970, P. 10-17  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--PHYSICS  
  
TOPIC TAGS--CYCLOTRON RESONANCE, RESONANCE ABSORPTION, RAREFIED PLASMA,  
ELECTRON OSCILLATION, HIGH TEMPERATURE PLASMA, LOW TEMPERATURE PLASMA  
  
CONTROL MARKING--NO RESTRICTIONS  
  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1978/1504 STEP NO--UR/0057/70/040/000/0010/0017  
CIRC ACCESSION NO--AP0046343  
UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0046343

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE ABSORPTION OF CYCLOTRONIC WAVES IN A BOUNDED, RAREFIED PLASMA UNDER CONDITIONS WHEN THE LARMOR ELECTRON FREQUENCY SUBSTANTIALLY EXCEEDS THAT OF THE PLASMA. A STUDY IS MADE OF SEVERAL CASES OF HIGH TEMPERATURE, COLLISIONLESS PLASMA, AND COLD PLASMA WITH A HIGH COLLISION NUMBER. USING THE DEVELOPED THEORY, AN EVALUATION IS MADE OF THE EXPERIMENTS MADE BY BUDNIKOV ET AL (1967) AND AKULINA ET AL (1969) WHICH INVOLVED THE ABSORPTION OF CYCLOTRONIC WAVES IN A BOUNDED PLASMA. FACILITY: AKADEMIIA NAUK SSSR, FIZICHESKII INSTITUT, MOSCOW, USSR.

UNCLASSIFIED

1/2 030 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--INTERACTION OF RELATIVISTIC ELECTRON BEAMS WITH THE PLASMA AND THE  
PROBLEM OF CRITICAL CURRENTS -U-  
AUTHOR--(02)-BOGDANKEVICH, L.S., RUKHADZE, A.A.  
COUNTRY OF INFO--USSR *B*  
SOURCE--(NP, 18233) 1970. 66P. DEP. CFSTI  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--ELECTRON BEAM, ELECTRON PLASMA, PLASMA INTERACTION, PLASMA  
STABILITY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3001/1543 STEP NO--UR/0000/70/000/000/0066/0066  
CIRC ACCESSION NO--AT0127041  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AT0127041

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AIM OF THEORETICAL STUDIES IN THE FIELD OF ELECTRON BEAM PLASMA INTERACTIONS IS THE CLARIFICATION OF THE CRITICAL PLASMA AND BEAM PARAMETERS THAT CAUSE INTERACTION WITHIN A LIMITED SYSTEM. FOR THIS REASON, THE BEHAVIOR OF AN ELECTRON BEAM WITHIN AN EQUIPOTENTIAL DRIFT SPACE ALONG THE AXIS OF A METALLIC WAVEGUIDE WAS EXAMINED. THE CRITICAL CURRENTS THAT MAY PASS THROUGH SUCH A SYSTEM MAY BE DETERMINED ON THE BASIS OF THE STABILITY CONDITIONS OF THE ELECTRON BEAM, OR ITS PASSAGE THROUGH THE COMPENSATION IONIC BACKGROUND OR THROUGH THE MORE DENSE PORTIONS OF THE PLASMA; THIS REQUIRED A MORE DETAILED STUDY OF THE BEAM STABILITY. THE INVESTIGATION INVOLVED AN EXAMINATION OF THE BOUNDARY CURRENTS IN NONCOMPENSATED ELECTRON BEAMS, CRITICAL CURRENTS IN COMPENSATED, UNLIMITED BEAMS, THE EFFECT OF THE LONGITUDINAL DIMENSIONS OF THE SYSTEM ON THE CRITICAL CURRENTS IN THE ELECTRON BEAMS, THE INTERACTION OF RELATIVISTIC ELECTRONS WITH THE PLASMA, THE STABILITY OF THE BEAMS IN THE PLASMA, AND CRITICAL CURRENTS OF RELATIVISTIC ELECTRON BEAMS IN THE PLASMA. IT WAS CONCLUDED THAT WHEN THE ELECTRON BEAM CURRENT IS LOWER THAN BOTH THE CRITICAL CURRENT OF THE COMPENSATED BEAM AND THE BOUNDARY CURRENT OF THE NONCOMPENSATED BEAM, NO INSTABILITY IS GENERATED IN THE SYSTEM AT THE NEUTRALIZED STAGE. FACILITY: AKADEMIYA NAUK SSSR, MOSCOW. INSTITUT FIZIKI.

UNCLASSIFIED

1/2 030 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--INVESTIGATION OF THE HIGH FREQUENCY INSTABILITY THRESHOLD IN THE  
INTERACTION BETWEEN AN ELECTRON BEAM AND PLASMA -U-  
AUTHOR-(04)-BOGDANKEVICH, L.S., RAYZER, M.D., RUKHADZE, A.A., STRELKOV,  
P.S.  
COUNTRY OF INFO--USSR **B**  
SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,  
NR 4, PP 1219-1233  
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ELECTRON BEAM, PLASMA INTERACTION, PLASMA STABILITY, ELECTRON  
DENSITY, EXTERNAL MAGNETIC FIELD, PLASMA DENSITY, PLASMA OSCILLATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1486

STEP NO--UR/0056/70/058/004/1219/1233

CIRC ACCESSION NO--AP0106242

UNCLASSIFIED



2/2 030

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0106242

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CRITICAL PLASMA DENSITY FOR WHICH HIGH FREQUENCY INSTABILITY ARISES IN THE PLASMA BEAM SYSTEM IS DETERMINED EXPERIMENTALLY. THE DEPENDENCE OF THE CRITICAL DENSITY ON THE ELECTRON BEAM DENSITY, MAGNITUDE OF EXTERNAL MAGNETIC FIELD AND GEOMETRICAL DIMENSIONS OF THE SYSTEM IS INVESTIGATED. THE THRESHOLD CONDITIONS FOR EXCITATION OF ELECTROSTATIC OSCILLATIONS, DERIVED FROM AN ANALYSIS OF THE DISPERSION EQUATION FOR A RESTRICTED PLASMA BEAM SYSTEM, AGREE WITH THE EXPERIMENTAL DATA. A COMPARISON BETWEEN THE THEORY AND EXPERIMENT SHOWS THAT IN THE GIVEN EXPERIMENTAL CONDITIONS THE CRITICAL VALUES OF THE PLASMA DENSITY CORRESPOND TO EXCITATION OF AXIALLY SYMMETRIC OSCILLATION MODES. FACILITY: FIZICHESKIY INSTITUT IM. P. N. LEBEDEVA, AN SSSR.

UNCLASSIFIED

AT0034872

NUCLEAR SCI. ABST. 1/70 UR 0000

3413 (AEC-tr-7073) ANOMALOUS ABSORPTION OF CYCLOTRON WAVES IN CONFINED PLASMA. ~~Bogdankevich, L. S.;~~  
Rukhadze, A. A. (Akademiya Nauk SSSR, Moscow, ~~Inst. of Piz-~~  
iki). Translation of Russian preprint No. 72. 20p. Dep. CFSU.

The absorption of the cyclotron electron waves in a confined and rarefied plasma was investigated when the Larmor frequency of electrons exceeded considerably that of the plasma. Under such conditions the extraordinary cyclotron wave is absorbed rather strongly in a spatially unlimited plasma, while the ordinary wave is practically not absorbed at all. In a limited plasma (for example, a waveguide filled with plasma), due to the interaction of waves at the plasma boundary, absorption of the ordinary waves may become anomalously high if the wave length is of the order of the plasma dimension. At this, the absorption factor becomes an oscillating function of the wave length and system dimensions. Cases of high-temperature plasma without collisions and of cold plasma with a great number of collisions were examined. Recent experiments on absorption of the cyclotron waves in a limited plasma are discussed on the basis of the newly developed theory.  
(auth)

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19711586

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USSR

B

BOGDANKEVICH, L. S.; RAYZER, M. D.; et al (Lebedev Physics Institute, USSR Academy of Sciences)

"Study of the Threshold of High-Frequency Instability Occurring during Interaction of an Electron Beam with a Plasma"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki; April, 1970; pp 1219-33

ABSTRACT: An experimental determination is made of the critical density of a plasma in which a high-frequency instability occurs with a plasma beam. The authors study the dependence of the critical density on the energy of the electron beam, the magnitude of the external magnetic field, and the geometrical dimensions of the system. The threshold conditions of excitation of the electrostatic oscillations, found from an analysis of the dispersion equation for a confined plasma beam, agrees with the experimental data. A comparison of theory with experiment shows that under the experimental conditions studied, the critical values of the density of the plasma correspond to the excitation of the axisymmetric mode of oscillation.

1/1

USSR

UDC 621.372.325

BOGDANKEVICH, O.V., ZVEREV, M.K., PECHENOV, A.N., SIMIRYAK, I.O.

"On The Divergency Of Radiation Of Lasers Of The 'Radiative Mirror' Type With Electron Pumping"

Kvantovaya elektronika (Quantum Electronics), Moscow, No 6(12), 1972, pp 110-111

Abstract: The dependence is studied of the radiation divergence of a semiconductor laser with a "radiative mirror" type resonator and electron beam pumping on the distance  $L$  to the external mirror. (Pumping was conducted with a pulsed beam of electrons which have an energy of 170 keV, a current density up to  $25 \text{ a/cm}^2$ , and a duration of 200 nanosec.) A minimum divergence of  $7^\circ$  was observed at  $L$  equals 28 mm and a diameter of the excited region of 300 microns, which corresponds to the diffraction limit of divergence of the fundamental type of oscillations. It is shown that an increase of  $L$  leads to a decrease of the width of the longitudinal mode. With  $L$  equals 22 mm the measured width of the mode amounted to  $\Delta\lambda \leq 0.05 \text{ \AA}$ . 1 fig. 4 ref. Received by editors, 26 March 1972

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USSR

UDJ 621.378.325

BOGDANKEVICH, O.V., BORISOV, N.A., KALENDIN, V.V., KOVSH, I.B., KRYUKOVA, I.V.

"Kinetics Of Reproduction Of Luminescent Properties Of GaAs Single Crystals Irradiated By An Intense Beam Of Electrons"

Kvantovaya elektronika (Quantum Electronics), Moscow, No 5(11), 1972, pp 108-111

Abstract: In previous papers by the authors, studies of the principal characteristics of a GaS laser with pumping by a beam of electrons with an energy up to 1 Mev (i.e., above the threshold for formation of defects) showed that with a sufficiently prolonged operation of the laser in such a regime, a decrease of power was observed at approximately 30--50 percent. However, annealing of the crystals at room temperature over several hours leads to practically a complete reduction of it. In the present work new results are reported concerning improvement of the radiating power of GaAs after irradiation by intense electrons. Irradiation of the single crystal was conducted at 300° K with the following parameters of the electron beam: energy of electrons, 600 kev; current density in beam, 20--30 a/cm<sup>2</sup>; duration of current impulse, 15 nanosec; and recurrence frequency, 1--2 Hz. Before and after irradiation the spectra were studied of the photoluminescence of specimens in the 0.75--1.2 micron region at 78° as well as the change of the laser threshold of generation with excitation by electrons, 1/2

USSR

BOGDANKEVICH, O.V., et al., Kvantovaya elektronika, Moscow, No 5(11), 1972, pp 108-111

and a 50 kev energy at 300° K. The specimens had the form of a rectangular parallelepiped: length of resonator 0.5--1 mm, thickness 0.2 mm, width 2--3 mm. The gallium arsenide was grown by the Czochralski method and doped with tellurium to a concentration of  $5 \cdot 10^{17} \text{ cm}^{-3}$  as well as by the liquid epitaxy method (without doping) with a concentration of carriers of  $1.2 \cdot 10^{15} \text{ cm}^{-3}$  and a mobility of  $46,000 \text{ cm}^2/\text{sec}$  at 78° K. (The total concentration of impurity in these specimens amounted to  $10^{16} \text{ cm}^{-3}$ .) An increase of photoluminescent intensity and a decrease of the laser threshold was observed in the n-GaAs:Te. These changes depend on the intensity and dose of irradiation and the parameters of the initial material. In the non-doped epitaxial specimens an improvement of the luminescent properties was not observed. A qualitative explanation is given of the observed effects. The authors thank O.N. Grigor'yev for measurement of the spectrum of x-ray reflection. 3 fig. 8 ref. Received by editors, 28 Feb 1972.

2/2

USSR

UDC: 621.378.329

BOGDANKEVICH, O. V.; BORISOV, N. A., LAVRUSHIN, B. M., LEBEDEV, V. V., NEGODOV, A. G., STREL'CHENKO, S. S.

"Waveguide Structure of the Cavity in a Semiconductor Laser With Electron-Beam Pumping"

Moscow, Kvantovaya Elektronika, Sbornik Statey, No 2(8), 1972, pp 61-68

Abstract: A method is described for creating a cavity with waveguide structure in a semiconductor laser with electron-beam pumping. It is shown that waveguide modes are stimulated in such a cavity, with the result that the emission threshold is independent of the energy of the electrons, and the radiation pattern has a structure which is more complex than in a uniform cavity. This type of cavity reduces the emission threshold to  $0.5 \text{ A/cm}^2$  (in the 15-20 keV electron energy region), which is 1-2 orders of magnitude lower than in a cavity of homogeneous structure. Five illustrations, four tables, bibliography of nine titles.

1/1

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USSR

UDC 621.378.329

BOGDANKEVICH, O. V., KOROLEV, S. V., NASEDKIN, A. A., OLIKHOV, I. M.,  
PETROV, D. M.

"Use of a Microwave-Modulated Electron Beam for Semiconductor Laser Pumping"

Moscow, Kvantovaya Elektronika, Sbornik Statey, No 4, "Sovetskoye Radio",  
1971, pp 97-99

Abstract: SHF modulation of semiconductor laser emission is achieved by using a microwave-modulated electron beam for laser pumping. A mode of emission is obtained in which multiple division of the pulse repetition frequency with respect to the frequency of the modulating SHF signal is attained. The authors thank V. A. Dorofeyev and G. N. Yanonis for assistance with the work. Three figures, bibliography of six titles.

1/1



USSR

UDC 621.378.35

BOGDANKEVICH, O.V., ZVEREV, M.M., KOLOMIYSKIY, A.N., PECHENOV, A.N.,  
VASIL'YEV, B.I.

"Multielement Semiconductor Laser Of The 'Emitting Mirror' Type"

Kvantovaya elektronika, Moscow, No 5, May 71, pp 95-96

Abstract: The construction and some characteristics are described of a multi-element laser of the emitting mirror type. A high-voltage pulse electron gun was used for pumping of the laser, with a beam energy of 108 keV and a current density of  $20 \text{ A/cm}^2$ . The polished plane-parallel disks 0.2-mm thick used as the working medium were cut out of single crystals of n-type conductivity gallium-arsenide doped with tellurium to a concentration of  $(1-2) \cdot 10^{18} \text{ cm}^{-3}$ . The generation power increases linearly with an increase of the cross section of the multielement target. A power of 28 kW is attained with a crystal with a  $1 \text{ cm}^2$  area. The halfwidth of the directivity pattern is  $7^\circ$ , and the generation spectrum consists of several lines corresponding to the modes of the Fabry--Perot resonator. Received by editors, 28 Apr 71. 2 fig. 6 ref.

1/1

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Lasers/Masers

USSR

UDC 621.373:530.145.6

BOGDANKEVICH, O. V., ZVEREV, M. M., MESTVIRISHVILI, A. N., NASIBOV, A. S., PECHENOV, A. N., SVINENKOV, A. I., FEIOSEYEV, K. P.

"A High-Power Semiconductor Maser With Electron Beam Pumping"

V sb. Kvant. elektronika (Quantum Electronics--collection of works), No 2, Moscow, 1971, pp 92-93 (from RZh-Radiotekhnika, No 7, Jul 71, Abstract No 7D113)

Translation: To increase the power of a semiconductor maser with electron beam pumping, the authors study multielement structures of gallium arsenide and cadmium sulfide. An emission power of 1.5 MW is achieved when a semiconductor maser on gallium arsenide is excited by an electron beam with an energy of 300 keV and a current of 300 A. Two illustrations, bibliography of five titles.

1/1

USSR

UDC 621.378.35

BOGDANKEVICH, O. V., ZVEREV, M. M., MESTVIRISHVILI, A. I., HASIBOV, A. S.,  
PECHENOV, A. N., SVINENKOV, A. I., FEDOSEYEV, K. P.

"A High-Power Semiconductor Laser With Electron-Beam Pumping"

Moscow, Kvantovaya Elektronika, No 2, 1971, pp 92-93

Abstract: Multiple-element structures of gallium arsenide and cadmium sulfide are studied for the purpose of increasing the power of a semiconductor laser with electron-beam pumping. An emission power of 1.5 kW is achieved when a gallium arsenide semiconductor laser is stimulated by a beam of 300 keV electrons at 300 A. Two figures, bibliography of five titles.

1/1

USSR

UDC 621.373.029.7.004.14:681.3

BOGDANKOVICH, O. V., HASIBOV, A. S., NOVIKOV, A. A., PECHENOV, A. N.,  
FEDOROV, V. B., TSVETKOV, V. V.

"Some Possibilities of Applying a Semiconductor Laser with Electron Excitation in Computers"

Moscow, Radiotekhnika i Elektronika, Vol XVI, No 5, May 1971, pp 824-828

Abstract: A study is made of the requirements on a cathode ray tube based on a semiconductor laser with electron excitation beginning with the problems of creating prospective optoelectronic memories. Experimental and theoretical results confirming the possibility of satisfying these requirements are presented.

The threshold current density is plotted as a function of the electron energy for various sizes of the excited domain  $d$  and reflection coefficients of the mirrors. With a beam energy of 100 kiloelectron volts and a current density of 10 amps/cm<sup>2</sup> from a cell 210 microns in diameter, the output power was 5 watts, and the conversion efficiency was 1.5 percent. Since the pulse length of the electrons in the beam was  $10^{-7}$  seconds, the radiation energy was  $5 \cdot 10^{-7}$  joules. Consequently, in order to obtain the radiation energy of 1/2

USSR

BOGDANKEVICH, O. V., et al., Radiotekhnika i Elektronika, Vol XVI, No 5, May 1971, pp 824-828

$10^{-7}$  joules required to insure a read rate of  $B = 10^8$  bits/second, under all other equal conditions, the size of the spot on the laser screen of the cathode ray tube has to be about 100 microns. The pulse power of the radiation will be 1 watt and the mean power,  $10^{-2}$  watts, and a screen with  $10^5$  positions will be about  $40 \times 40$  mm. A screen spot size up to 300 microns is required to insure a read rate of  $10^9$  bits/second.

2/2

- 101 -

USSR

UDC 631.436.843:621.375.3

B  
BASOV, N. G., BOGDANKEVICH, O. V., NASIBOV, A. S.

"Cathode Ray Tube"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 16,  
8 May 70, p 57, Patent No 270100, Filed 20 Feb 67

Translation: 1. This Author's Certificate introduces a cathode ray tube which is in the form of an evacuated bulb containing an electron gun with an electron beam control system and a converter for converting the electron beam energy to light energy. The tube is distinguished by the fact that to increase directivity and brightness of glow of the image, the converter is executed in the form of a monocrystalline film with smooth surfaces. The film made of semiconductor material is excited by the electron beam and constitutes an active laser element.

2. A second cathode ray tube like in item 1 is introduced. It is distinguished by the fact that to improve the directivity of glow of the image, the semiconductor film is attached to an optically transparent plane-parallel plate which, together with the film, forms an optical resonator.

1/1

Antennas

USSR

UDC: 621.396.670.951

IVANOVA, N. S., BOGDANOV, A. A., MESROPOV, G. M., OGANOVA, L. A., ZUYEV, F. K., YEGOROV, Ye. M.

"A Fiberglass-Reinforced Polarization Material"

Moscow, Otkrytiya, Izobreneniya, Proizhlyennyye Obraztsy, Tovarnyye Znaki, No 30, Oct 71, Author's Certificate No 317137, Division H, filed 30 Sep 64, published 7 Oct 71, p 193

Translation: This Author's Certificate introduces a fiberglass-reinforced polarization material based on textolite for antenna reflectors. As a distinguishing feature of the patent, the weight of the reflector is reduced by adding to the glass-textolite reinforcement a layer of metallized glass fabric which contains metallized glass filaments in one of the directions of its structure (warp or weft). The glass filaments consist of elementary glass fibers coated with a layer of metal (aluminum or zinc) securely bonded to the glass fiber surface.

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Antennas

USSR

UDC: 538.56:621.396.67

BOGDANOV, A. A., BRUSIN, I. Ya., and SKVORTSOV, V. D.

"Effect of Photofilm Noise in Optical Processing Systems for the Signals of Synthesizable Aperture Antennas"

Gor'kiy, Izvestiya VUZ--Radiofizika, Vol. 14, No. 1, 1971, pp 114-126

Abstract: Photographic film is used for recording purposes in antennas with synthesized apertures. In ordinary photography, the noise characteristics of this film is unimportant; in antennas of this type, however, they are extremely important since they can spoil the information capability of the system. This article shows that the film noise imposes limits on the antenna's dynamic range and on the number of discernible levels of signal intensity, leading also to a loss in resolving power. The authors also describe a method for measuring the noise parameters, and obtain quantitative results for film type Mikrat-300. In the development of

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USSR

BOGDANOV, A. A., et al., Izvestiya VUZ--Radiofizika, Vol 14, No 1, 1971,  
pp 114-126

their analysis, the authors refer to an earlier paper (Cutrona, L. J., et al, Proc. IEEE, 54, No 8, 1966) in which this type of antenna is described. Using a formula for the transparency of the ideal film given in that paper, the authors describe an experimental system for determining the factors in that formula.

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- 5 -

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Soviet Inventions Illustrated, Section II Electrical, Derwent,

243206 RECORDING SEISMIC INFORMATION from a  
processing machine can be done via a cathode  
ray tube and a photo-sensitive means of recording  
the display, but cannot record variants of the  
information for one cycle of operation of the  
processing. The proposed device does this by  
incorporating in the system, consisting of tube 3,  
objective 4, and cassette 6 holding the photo-  
sensitive device, a rotatable multi-faced prism 1  
which can be fixed to present any desired face in  
order to photograph the record. When the param-  
eters of the information are changed, the prism is  
moved round so as to present a new face. This can  
be done mechanically, or be connected electrically  
1.2.68 as 1214260/26-25.0.I.SPASIBUKHOV et al.

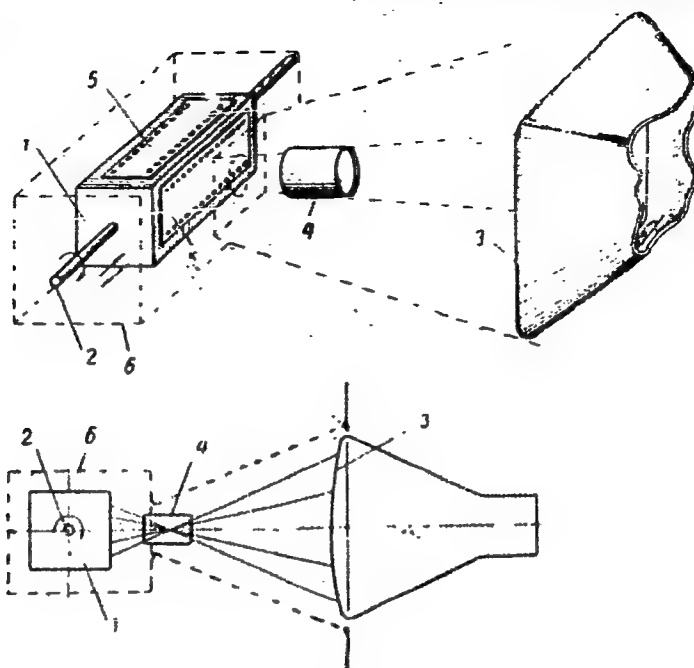
PETROLEUM & GAS CHEMICAL INST.(18.9.69) Bul 16/  
5.5.69. Class 42c. Int.Cl.G 01v.

AUTHORS: Spasibukhov, O. I.; Rodanov, A. A.; Petrov, L. A.  
Napalkov, Yu. V.; Voskresenskiy, Yu. V.

Moskovskiy Institut Neftekhimicheskoy i Gazovoy Promyshlennosti im.  
Akad. I. M. Gubkina

19771355

AA0044646



19771356

1/2 019 UNCLASSIFIED PROCESSING DATE--18SEP70  
TITLE--DOMAINS AND ORIENTATION OF A FERROMAGNETIC MOMENT NEAR THE SURFACE  
IN A HEMATITE CRYSTAL -U-  
AUTHOR--(02)-BOGDANOV, A.A., VLASOV, A.YA.  
COUNTRY OF INFO--USSR *B*  
SOURCE--FIZ. TVERD. TELA 1970, 12(1) 164-9  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS, PHYSICS  
TOPIC TAGS--IRON OXIDE, MAGNETOSTRICTION, SINGLE CRYSTAL, FERROMAGNETIC  
DOMAIN  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1980/0244 STEP NO--UK/0181/70/012/001/0164/0169  
CIRC ACCESSION NO--AP0048523  
UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0048523

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DOMAINS ON THE SURFACE OF SINGLE CRYSTALS OF HEMATITE WERE OBSD. BY THE POWDER METHOD AND WITH THE AID OF THE MAGNETOOPTICAL KERR EFFECT. CONDITIONS FOR OBSERVATION OF THE DOMAINS AND THEIR BEHAVIOR IN REMAGNETIZATION OF THE CRYSTAL SHOW THAT ON SURFACES DIFFERENT FROM THE BASIS PLANE, THE NORMAL COMPONENT OF THE FERROMAGNETIC MOMENT IS LARGE. THE INVESTIGATED CRYSTALS EXHIBIT QUITE SMALL MAGNETOCRYST. ANISOTROPY IN THE BASIS PLANE. THE OBSD. ORIENTATION IS DETD. BY THE PRESENCE OF SURFACE MAGNETIC ANISOTROPY, THE EFFECTIVE FIELD OF WHICH IS OF THE ORDER OF SEVERAL KOE.

USSR

UDC 669.721.372

BARANIK, I. A., YASTREPOVA, Z. V., YEGOROV, A. P., ZHEUROV, V. V., CHEPAL'SKIY,  
YE. N., BOGDANOV, A. P.

"Industrial Investigation of the Influence of Titanium Impurities on the  
Electrolysis of Magnesium Chloride"

Tsvetnye Metally, No 8, 1971, pp 40-42

Abstract: Results are presented from a chemical analysis of the presence of titanium in the raw material and products of electrolysis. Material balances with respect to titanium are calculated for several commercial electrolyzers. It is demonstrated that regardless of the content of fluorine in the electrolyte, the decrease in the yield of magnesium per current may reach 5-20% when lower titanium chlorides are added to the electrolyzer. The influence of metallic titanium is significantly weaker. On the basis of an analysis of results of commercial studies, necessary measures to combat the harmful influence of titanium on electrolysis are discussed.

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1/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--BIOLOCATION DIAGNOSIS OF EFFUSIONS IN SEROUS CAVITIES -U-

AUTHOR--(02)-BOGIN, YU.B., BOGDANOV, A.V. *B*

COUNTRY OF INFO--USSR

SOURCE--TERAPEVTICHESKIY ARKHIV, 1970, VOL 42, NR 5, PP 87-91

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HEART DISEASE, RESPIRATORY SYSTEM DISEASE, DIAGNOSTIC MEDICINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0471

STEP NO--UR/0504/70/042/005/0087/0091

CIRC ACCESSION NO--AP0121145

UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121145

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RESULTS OF BIOLOCATION DIAGNOSIS OF EFFUSIONS IN SEROUS CAVITIES IN 159 PATIENTS (ASCITIS IN 53, PERICARDITIS IN 38, PLEURISY IN 74) GIVE GROUND TO CONSIDER THAT ECHOGRAPHIC STUDY MAKES IT POSSIBLE TO STAGE AN ACCURATE DIAGNOSIS OF THE BLOOD ACCUMULATION IN SEROUS CAVITIES AND TO ESTIMATE ITS QUANTITY.

FACILITY: 3-YA KAFEDRA KHIRURGII TSENTRAL'NOGO INSTITUTA USOVERSHENSTVOVANIYA VRACHEY AND LABORATORIYA BIOLOKATSIONNOY DIAGNOSTIKI NA BAZE TSENTRAL'NOY KLINICHESKOY BOL'NITSY MINISTERSTVA PUTEY SOOBSHCHENIYA, MOSCOW.

UNCLASSIFIED



1/2 014 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--ULTRASOUND DIAGNOSIS OF PNEUMONIA -U-  
AUTHOR--(05)-BOGIN, YU.N., MUTINA, YE.S., BOGDANOV, A.V., SHIRSHOVA, T.N.,  
BEDUKHINA, L.I.  
COUNTRY OF INFO--USSR  
SOURCE--KLINICHESKAYA MEDITSINA, 1970, VOL 48, NR 6, PP 123-138  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--PNEUMONIA, ULTRASOUND, DIAGNOSTIC MEDICINE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3005/1474 STEP NO--UR/0497/70/048/006/0123/0128  
CIRC ACCESSION NO--AP0133410  
UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0133410

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS EVALUATED THE DIAGNOSTIC POSSIBILITIES OF THE BIOLOCATION TECHNIQUE IN ACUTE AND CHRONIC PNEUMONIA. THERE WERE 31 PATIENTS WITH ACUTE PNEUMONIA AND 55 WITH CHRONIC. PATIENTS WITH ACUTE PNEUMONIA ON THE ECHOGRAM SHOW HETEROGENOUS FOCI OF INDURATION OF THE PULMONARY TISSU WHICH DISAPPEAR UPON RECOVERY. IF PNEUMONIA IS COMPLICATED BY ACUTE PLEURISY ON THE ECHOGRAM THE LAYER OF FLUID IS REFLECTED IN THE FORM OF NONINTENSIVE HOMOGENOUS SHADOW. THE PNEUMONIC FOCUS IS WELL SEEN BEYOND THE FLUID LAYER. AN EXACERBATION OF CHRONIC PNEUMONIA IS ACCOMPANIED BY THE APPEARANCE OF HETEROGENOUS FOCI OF PULMONARY TISSUE INDURATION. FACILITY: IV KAFEDRA TERAPII I II KAFEDRA KHIRURGII TSENTRAL'NOGO INSTITUTA USOVERSHENSTVOVANIYA VRACHEY, MOSKVA, BIOLOKATSIONNAYA LABORATORIYA NA BAZE TSENTRAL'NOY KLINICHESKOY BOL'NITSY MINISTERSTVA PUTEY SGOBSHCHENIYA, MOSKVA.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--REPLATED OPERATIONS ON THE LUNGS AND PLEURA --U-  
AUTHOR--(03)--MANEVICH, V.L., BOGDANOV, A.V., STONOGIN, V.D.  
COUNTRY OF INFO--USSR B  
SOURCE--KHIRURGIYA, 1970, NR 6, PP 62-66  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--THORACIC SURGERY, LUNG, DIAGNOSTIC MEDICINE  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3002/1767 STEP NO--UR/0531/70/000/006/0062/0066  
CIRC ACCESSION NO--AP0129135  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0129135

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE DEPICTS AN ANALYSIS OF 21 REPEATED OPERATIONS ON THE LUNGS AND PLEURA PERFORMED IN PATIENTS WHO WERE PREVIOUSLY OPERATED UPON IN OTHER HOSPITALS. IN THE OVERWHELMING MAJORITY OF CAUSES OF FAILURE WERE DUE TO INCOMPLETE EXAMINATION OF THE PATIENT BEFORE THE FIRST OPERATION (4) AND HENCE A NONRADICAL OPERATION, TECHNICAL ERRORS COMMITTED DURING THE OPERATION (7), COMPLICATIONS OCCURRING IN THE IMMEDIATE POSTOPERATIVE PERIOD (3). A TRUE RELAPSE OF THE DISEASE WAS REVEALED ONLY IN 2 CASES. THE METHODS OF EXAMINATION TO PATIENTS ADMITTED FOR REPEATED OPERATIONS ARE ANALYZED. THE RESULTS OF REPEATED OPERATIONS ARE GIVEN. OUT OF 21 PATIENTS OPERATED 6 DIED. A CONCLUSION IS MADE THAT OPERATIONS ON THE LUNGS SHOULD BE PERFORMED IN SPECIALIZED HOSPITALS, THIS WILL ENABLE TO REDUCE THE NUMBER OF COMPLICATIONS, INCLUDING THOSE WHICH REQUIRE A REPEATED OPERATIVE INTERVENTION. FACILITY: 3-YA KAFEDRA KLINICHESKOY KHIRURGII TSIU, MOSKVA.

UNCLASSIFIED

USSR

PLATONOV, P. N., Doctor of Technical Sciences, TRIBEL'GORN, E. V., Candidate of Technical Sciences, BOGDANOV, B. K., Engineer

"Methods of Changing Over to Automatic Control of Continuous Mass Production Systems"

Moscow, Mekhanizatsiya i Avtomatizatsiya Proizvodstva, No 9, 1970, pp 16-19

Abstract: An analysis of continuous mass production systems in various sectors of the national economy conducted at the Odessa Technological Institute imeni M. V. Lomonosov made it possible to isolate the general functional singularities of various segments of the systems and to reduce them to eight types. The classification of segments of the continuous mass production system and the principles of setting up a dispatcher automated control system on this basis comprised of standard general-purpose modules were taken up at the Third All-Union Conference on Automatic Control. The analysis was based on the example of a modular dispatcher automated control system for the most complex production line segment requiring sixteen modules. Further studies showed that the number of modules required for realization of this segment can be reduced to ten. It is shown that further automation of continuous mass production systems should be based on a transition from dispatcher automated control to operatorless programmed

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USSR

PLATONOV, P. N., et al, Mekhanizatsiya i Avtomatizatsiya Proizvodstva, No 9, 1970, pp 16-19

control. This will require analysis of the dispatcher's functions for purposes of algorithmic description, classification of the dispatcher's functions, and a description of the information which must be stored. A simple formula is found for the optimum control system from the standpoint of cost. It is shown that the function of route analysis can be handled by an automatic device without extensive modification of the dispatcher control system.

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- 8 -

USSR

UDC 539.125.4

BOGDANOV, D. D., KARNAUKHOV, V. A., PETROV, L. A.

"Telescope for Recording Low-Energy Protons Against an Intense Beta Background"

Moscow, Pribery i Tekhnika Eksperimenta, No 5, 1972, pp 28-30

Abstract: A study was made of the problem of lowering the sensitivity of a telescope system to electrons in order to make it possible to record protons with  $E$  less than 1.0 megaelectron volts. A telescope is described which comprises 2 planar proportional counters and a semiconductor detector designed for spectrometric analysis of low-energy protons (0.5-6.0 megaelectron volts) in the presence of intense  $\beta$  and  $\gamma$  radiation backgrounds. Utilization of comparisons of the proportional counters in the control channel essentially reduces the  $\beta$ -background of the semiconductor detector by comparison with the case where only one counter is used for the control. With variation of the threshold in the control channel the intensity of the spectrum varies uniformly in accordance with the hypothesis of independent formation of the spectra in the two counters. The introduction of a 3.0 kiloelectron volt threshold in the control channel leads to a twenty-fold reduction in intensity of the count with respect to the entire spectrum of the first counter.

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USSR

UDC 669.3'26'295.018.9.4

NIKOLAYEV, A. K., BOGDANOV, D. R.

"Purification of Copper-Chromium and Copper-Titanium Alloy of Slag Inclusions Using Filtration Through Chunk Filters"

Tr. N.-i. i Proekt. In-ta Splavov i Obrabotki Tsvet. Met. [Works of Scientific Research and Planning Institute for Alloys and Processing of Nonferrous Metals], No 35, 1971, pp 20-22, (Translated from Referativnyy Zhurnal, Metallurgiya, No 5, 1972, Abstract No 5 G376 by the author<sub>s</sub> ).

Translation: Results are presented from work on purification of Cu-Cr and Cu-Ti alloys of slag inclusions by filtration of the melt through chunk filters. 1 Figure; 2 Tables; 2 Biblio. Refs.

1/1

- 69 -



Acc. Nr.

AP0040013

Abstracting Service:  
CHEMICAL ABST. 4-70

Ref. Code

UR 0096

B

68892j Reasons for the appearance of deposits on heating surfaces cooled by organic heat-transfer agents. Boydanov, F. F. (USSR). Teploenergetika 1970, 17(1), 64-8 (Russ). Gas oil fractions from the direct distn. of crude oil of predominantly aromatic compn. can be used as heat-transfer media in energy-producing at. reactors. The formation of deposits in the Soviet ARBUS reactor, which employs hydrostabilized gas oil, is described. The temp. of the hot wall should not exceed 623°K and surface boiling is not permissible. At 633°K, after 35 hr of operation, the deposits begin to form accompanied by a temp. rise and after 40-50 hr the hot-wall temp. reaches 693° at a thermal flux of  $150-200 \times 10^2$  kcal/m<sup>2</sup> hr. The main reasons for formation of deposits are the high temp. or surface boiling. The flow rate of the heat-transfer medium has no effect on the deposit formation.

M. Shelef

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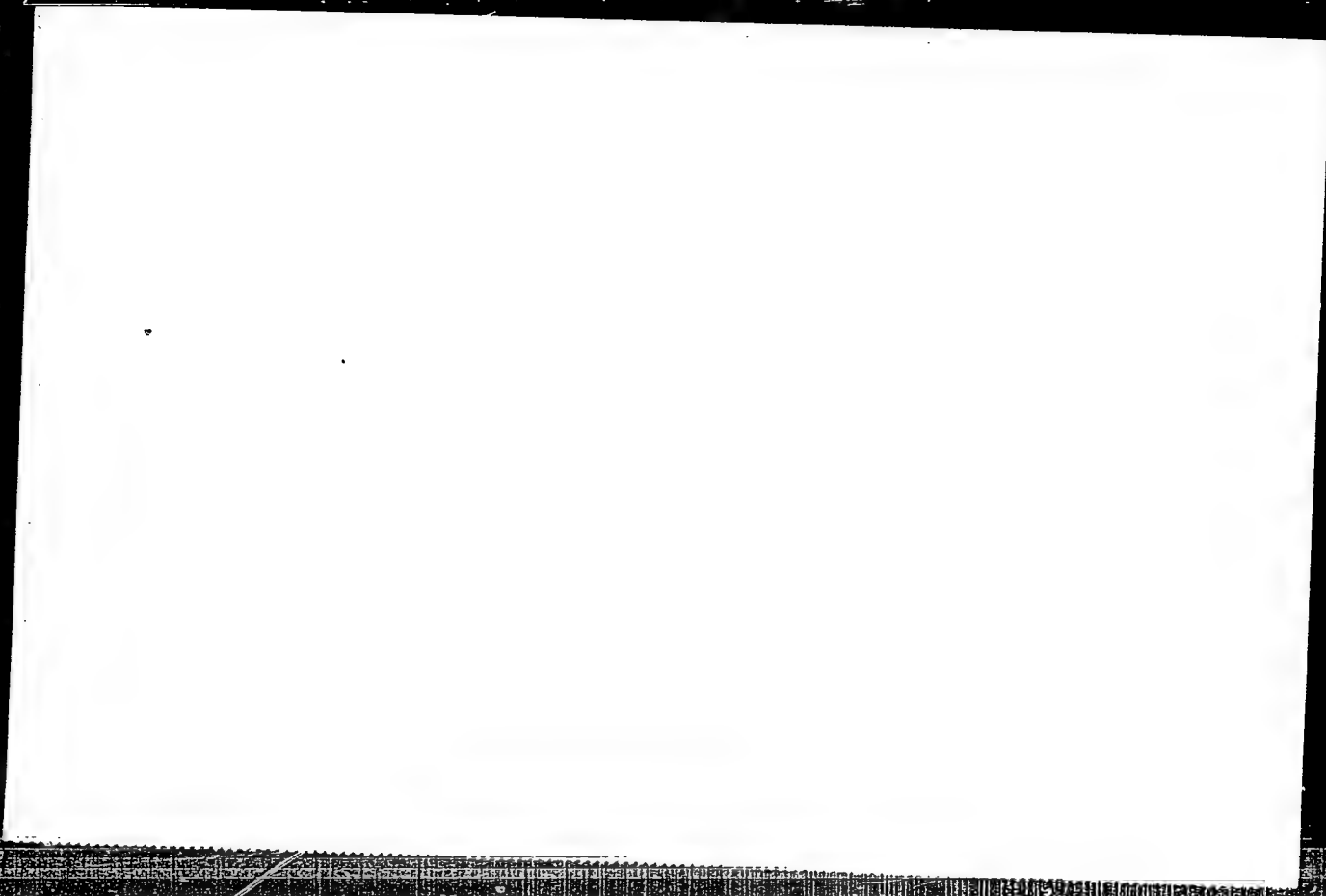
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Acc. Nr.

AP0048828

Abstracting Service:  
CHEMICAL ABST.

Ref. Code

UR0459

90933v Adsorption behavior of crystalline polyester and polyamides in a wide temperature range. Bogaevskaya, T. A.; Gatovskaya, T. V.; Kargin, V. A. / Fiz.-Khim. Inst. im. Karpova, Moscow, USSR). *Vysokomol. Soedin., Ser. A* 1970, 12(1), 243-7 (Russ). The adsorption properties of poly(ethylene sebacate) (I), polycaprolactam (II), and hexamethylenediammonium adipate-hexamethylenediammonium sebacate-II copolymer (III) were investigated at 30-225°. The adsorption of EtOAc by I films was described by hyperbolic isotherms, indicating a strong interaction between I and EtOAc leading to increased flexibility and mobility of the individual structural elements. Significant structural changes were detected at the same temp. at which "capillary condensation" of the sorbate vapors is obsd. Structural transformations in this case also apparently occurred via melting of material with low ordering. Decompn. of the supramol. structure occurred at >95°. The melt of the cryst. polymer was not a homogeneous, mol. dispersed system but contained ordered regions. Little adsorption (<1%) of n-hexadecane by II was obsd. from 130-230°.

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AP0048828

indicating that II is densely packed with few defects in its supramol. structure. II adsorbed 8-9% *n*-decyl alc. (IV) at 130-225°, indicating weak interaction between II and IV. "Capillary condensation" was not obsd. with II apparently because of its homogeneity and lack of flaws. III adsorbed IV much more than II at all temps. (130-225°), indicating that it had more defects in its supramol. structure and had more loosely packed structural elements.

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USSR

UDC 621.382.1.01-416:621.311.609

AYVANOVA, L. D. and POUDAN, G. I.

"Film Capacitors Using  $TiO_2$ "

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No. 5, 1971, pp 37-39

Abstract: A description is given of a method for preparing capacitors using Ti- $TiO_2$ -Al films and substrates of sodium and nonalkali glass. The results of experiments performed on these devices are also presented. Specimens with an oxide layer thickness of 1700 Å were found to have a specific capacitance of  $0.3 \mu F/cm^2$ ; the dielectric constant of the layer was 58. Frequency limits of the capacitors were a maximum of 5 MHz. Curves are plotted for the temperature and frequency dependences of the capacitance and dielectric characteristics of these devices. The authors are associated with the Kiev Polytechnical Institute.

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USSR

UDC 539.238:661.888.2

BOGDAN, G. I.

"Active Elements in Film Circuits"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No. 5, 1971, pp 51-56

Abstract: Dielectric films, their theory and mechanisms of operation, are discussed. The films can be divided into three categories: those with thicknesses of the order of one micron, with high resistivity and the characteristics of volume dielectrics; thin films less than 100 Å thick, with high conductivity as the result of the tunnel effect; films 100-4000 Å thick, which differ from the others in the greater complexity of their conductivity mechanism, where the passage of carriers inside the film is strongly affected by the composition of the dielectric and by the large quantity of impurities in the film. This description of film elements deals with N and S negative resistance types, which may be widely used in relaxation oscillator circuits, switching systems, and memory cells. A rather extensive bibliography on the subject is given, and plots are shown of the volt-ampere characteristics for Nb-Nb<sub>2</sub>O<sub>5</sub>-Me S-type structures at various temperatures, and for N-type structures of the same composition. The author is connected with the Kiev Polytechnical Institute.

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UDC 621.382:539.216.2

BOGDAN, G. I. and DIMAROVA, Ye. N.

"Investigating the Thermistor Characteristics of Fine-Film MDM Structures"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No. 5, 1971, pp 70-72

Abstract: A description is given of experimental research on the thermistor characteristics of metal-dielectric-metal structures in which the dielectric is a thin film, measuring 1000 Å, of Nb<sub>2</sub>O<sub>5</sub>. Such structures, with S-shaped volt-ampere characteristics, are considered by the authors to be very promising as low-inertia and high-sensitivity heat sensors. A cross-section view of the specimen is shown. It consists of a plate of metallic niobium, 2X3X0.5 mm, coated with an oxide layer, and its electrodes are metallic niobium and indium film coated by vaporization in a vacuum on the oxide layer. The volt-ampere characteristics of the specimens are plotted together with a curve indicating the linear drop in voltage on the specimen with increasing temperature. A table of parameters for several thermosensitive MDM structures prepared under various conditions is also provided. The authors note that the use

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BOGDAN, G. I. and DIMAROVA, Ye. N., Poluprovodnikovaya tekhnika i mikroelektronika, No 5, 1971, pp 70-72

of such structures as thermic sensors is advantageous because they are chemically stable and have a wide range of operating temperatures. They are connected with the Kiev Polytechnical Institute.

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USSR

UDC 539.238.661.888.2

NEKRASOV, H. H., BOGDAN, G. I.

"Electric Properties of Niobium Oxide Films"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No 5, 1971, pp 33-37

Abstract: The results of studying  $Nb_2O_5$  oxide films in the Nb-Nb $_2O_5$ -metal structure are presented. The volt-ampere characteristics of thin films ( $d \sim 100 \text{ \AA}$ ) are used to determine the height of the potential barrier at the dielectric-metal interface and the magnitude of the electron affinity of Nb $_2O_5$ . The dependence of the capacitance of thick films ( $d \sim 1,000 \text{ \AA}$ ) on the constant bias is established. This confirms the presence of a p-i-n junction in the oxide film.

The height of the potential barrier at the Nb-Nb $_2O_5$  interface was found to be 1.64 electron volts, the electron affinity for niobium oxide Nb $_2O_5$  was  $\psi = 2.34$  electron volts, and the dependence of the capacitance on the voltage for the p-i-n structure of niobium oxide films  $\sim 1,000 \text{ \AA}$  thick is expressed by the law  $C \sim 1/\sqrt{U_{\text{space}}}$ .

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USSR

UDC 621.396.6-181.5

AYVAZOVA, L.S., BOGDAN, G.I.

"Film Capacitors Based On  $TiO_2$ "

Poluprovodn. tekhn. i mikroelektronika. Resp. mezhved. sb. (Semiconductor Technology And Microelectronics. Interdepartmental Collection), 1971, Issue 5, pp 37-39 (from RZh--Radiotekhnika, No 9, Sept 1971, Abstract No 9V293)

Translation: Capacitors are obtained based on an electrolytically oxidized titanium film with a permittivity of  $0.5 \text{ microfarad/cm}^2$  and  $\text{tg } \delta = 0.01--0.05$ . The temperature and frequency characteristics of the specimens are shown. 3 ill. 2 ref. Summary.

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UDC 621.382.111.14

BOGDAN, G. I., and DIMAROVA, Ye. N.

"Study of the Thermistor Properties of a Thin-Film Metal-Dielectric-Metal Structure"

Pluprovodn. tekhn. i mikroelektronika. Resp. mezhved. sb. (Semiconductor Technics and Microelectronics. Republic Interdepartmental Collection), 1971, Issue 5, pp 70-72 (from RZh-Elektronika i yeye primeneniye, No 9, Sep 1971, Abstract No 9B490)

Translation: A study is made of the possibility of the use as a sensitive element of a thin-film metal-dielectric-metal structure with an active layer of a  $Nb_2O_5$  1000 Å thick. The sensitivity of the element to a change of temperature with a voltage less than the switching voltage is  $50 \pm 5$  mv/deg and the time constant with the given construction of the device is 1 sec. The effect is studied of regimes of oxidation and the formation by current on an oxide layer, on the stability and thermosensitivity of thermistors. 3 ill. 1 Tab. 4 ref.

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USSR

UDC 537.311.32

NEKRASOC, M. M., and BOGDAN, G. I.

"Electrical Properties of Niobium Oxide Film"

Poluprovodn. tekhn. i mikroelektronika. Resp. mezhved. sb. (Semiconductor  
Technics and Microelectronics. Republic Interdepartmental Collection), 1971,  
Issue 5, pp 33-37 (from RZh-Elektronika i yeye primeneniye, No 9, September  
1971, Abstract No 9B53)

Translation: The results are presented of a study of a  $Nb_2-Nb_2O_5-Me$ . The height of the potential barrier at the boundary of the dielectric and metal and the magnitude of the electron affinity of  $Nb_2O_5$  are determined by the voltampere characteristics of thin films ( $d \sim 100 \text{ \AA}$ ). The dependence of the capacitance of thick films ( $d \sim 1000 \text{ \AA}$ ) on a fixed bias is established which confirms the presence of a p-i-n junction in the oxide film. 14 ref. Summary.

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PRIMARY SOURCE: Vestnik Khirurgii, *I. I. Grekova*, 1970,  
Vol 104, Nr / , pp **20-23**

THE PRINCIPLES AND METHODS OF EARLY DIAGNOSIS OF PULMONARY  
CANCER

By *T. T. Bogdan*

The methods of early recognition of the pulmonary cancer are described. It is considered that chemotherapy could be the only method of radical treatment of this affection in its first "microscopic" stage.

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UDC: 632.951:631.563.006.5

BLAKITNAYA, L. P., Candidate of Biological Sciences, BOGDAN-BLAKIT-NAYA, L. R., Stavropol' Agricultural Institute

"Toxicity of Sumithion for Pests of Grain and Grain Products"

Moscow, Khimiya v Sel'skom Khozyaystve, Vol 10, No 5, 1973, pp 39-41

Abstract: Sumithion [0,0-dimethyl-O-(3-methyl-4-nitrophenyl)-thiophosphate], a pesticide made by the Japanese company "Sumitoma" was field-tested in the Stavropol'skiy Kray. It was found that Sumithion in a dose of 0.2 g/m<sup>2</sup> has excellent insecticidal and acaricidal properties, and is lethal for most insect and mite pests of granaries. When applied to a glass surface, the chemical showed contact action for about 20 days on the most harmful granary insects and mites. Because of its insecticidal and acaricidal properties against a broad spectrum of warehouse pests in the imaginal and pre-imaginal forms, and its low toxicity for warm-blooded animals, Sumithion (and possibly its analogs -- Metathion from Czechoslovakia, Folithion from West Germany, and Methylnitrophos made in the Soviet Union) may be extensively used for treating elevators and their environs and also equipment used in connection with grain storage.

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BOGDANETS, A. D.

FEASIBILITY OF GENERATING MEGAGAUSSES  
MAGNETIC FIELDS USING HIGH-PRESSURE  
COMPRESSED GAS LINTINGS

JPRS 59459  
9 JULY 1974

Article by Ye. E. Velikhov, A. A. Vedenov, A. B. Bogdanets, V. S. Gulyaev,  
G. G. Koshcheyev, A. A. Nedyk, I. G. Orlov, E. V. Ponomarev, V. I. Chernobai, Leningrad,  
8 June 1971, pp 429-436

The results of calculation of a setup, designed for  
generating a megagauss pulse magnetic field in a large  
volume, are presented in this article. The magnetic field  
is amplified by compression in a cylindrical metal case,  
pulsed by high-pressure gas (1,000-2,000 atm). The expected  
energy in the compressed magnetic field is several MJ and  
the lifetime of the field is of the order of 10  $\mu$ sec. In  
contrast to apparatus using explosives, the examined device  
is nondestructive; in contrast to devices used for compressing  
a shell with the energy of an electromagnetic field, the  
examined system does not experience the problems of super-  
power storage units and electromagnetic energy commutators.

Introduction

Pulsed megagauss fields, especially in a large volume and with high  
( $\sim 1$  MJ and above) energies, are very important in modern industry. Thus,  
they may be used for solving the problem of controlled thermonuclear  
synthesis [1], investigating matter at superhigh pressures [2], generating  
a pulse of electromagnetic energy at high power and energies (10<sup>11</sup>-10<sup>13</sup> W,  
10<sup>-10</sup> s). The literature contains the results of analysis of pulsed  
megagauss fields by collapsing a metal case using explosives [3] or the  
energy of a capacitor bank [4-6]. The use of explosives is technologically  
difficult and leads to total destruction of the system; the use of  
capacitor banks is limited for practical purposes to the energy level of  
10<sup>9</sup>-10<sup>7</sup> J.

The use of the energy of compressed gas for collapsing a cylindrical  
metal shell (liner), amplifying a magnetic field by "adiabatic" compression

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by the conducting cylinder, the generation of which are parallel to the magnetic force lines, is considered promising. The advantages of this method are: 1) the system is nondestructive; the advantages of this on strength are the same as in the case of the apparatus that uses electromagnetic energy, since the magnetic pressure that collapses the liner must have the same magnitude (1,000-2,000 atm); 2) rapid application of external pressure on the liner in the examined system does not require the development of high-power compressing systems; the electromagnetic set-up requires presently unavailable storage units and electromagnetic energy accumulators ( $10^4$ - $10^5$  J,  $10^1$ - $10^3$  W); explosive systems require synchronous detonation of the detonators; 3) the use of compressed gas makes it possible to attain more efficient transmission of energy to the field in comparison with explosives and current inductive storage systems.

The most important part of the pneumatic apparatus is the system for breaking a cylindrical diaphragm that holds back all the gas pressure by means of a cylindrical support (Fig. 1). Our apparatus incorporates a high-speed magnetic "theta-pinch" type coil [7], which generates the pulse that releases magnetic pressure.

In contrast to electromagnetic systems, the rate of collapse of the liner in a pneumatic system is limited to the speed of sound in  $H_2$ . When hydrogen is used at room temperature a radial liner velocity of  $10^3$  cm/sec is completely feasible and is attainable for most applications. Thus, in the case of thermonuclear experiments (compression of deuterium plasma in a magnetic field), the characteristic time of adiabatic compression is determined by a velocity of  $\sim 10^3$  cm/sec, which, finally, requires a very long magnetic field [8].

### 31. Description of Apparatus

The apparatus for storing and converting energy (Figure 1) consists of steel body 5, which houses support grate 3 and steel diaphragm 2, installed on it. In the cavity between the diaphragm and the body is gas ( $H_2$  or He) under a pressure of 1,000-2,000 atm.

The diaphragm is a thin-wall steel cylinder with a wall thickness of the order of 1 mm, which is necessitated by the need for rapid and synchronous opening of all parts of the diaphragm (32).

Magnetic diaphragm rupture system 4 consists of six turns (35), wound on insulators. The design of the elements of the magnetic system is illustrated in Figure 2.

The diaphragm rupture system is powered by pulsed capacitors through coaxial sealed cables 6, insulated for 50 kV. Inside the support grate, at a distance of 1-2 mm from its inner surface, is copper liner 1, 140 mm in diameter with a wall thickness of 1-2 mm. An initial magnetic field ( $B_0 = 1.2 \cdot 10^4$  G) is developed beforehand in the cavity of the liner.